

**Observations on Territoriality and a New Nesting Substrate of
Xylocopa californica arizonensis Cresson**
(Hymenoptera : Apoidea)

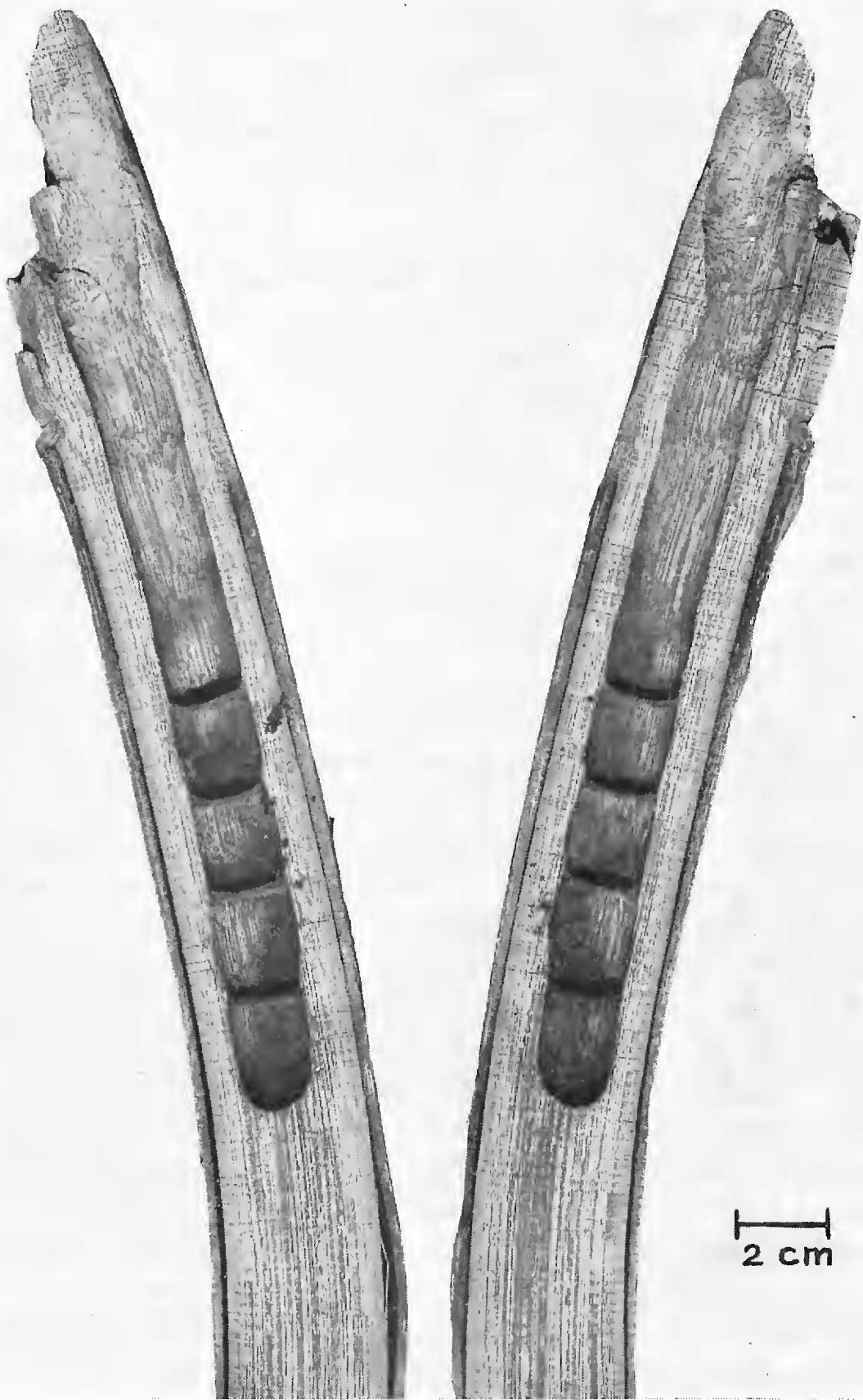
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On 10 April 1965 at 10 a.m. at the northwest clump of trees at Twentynine Palms Oasis, Joshua Tree National Monument, we observed 20 to 30 *Xylocopa (Xylocopoides) californica arizonensis* Cresson buzzing and flying in and out between the green leaves and skirt area of the fan palm, *Washingtonia filifera* (Lindl.) Wendl. This indicated a possible nesting site since the palms were not in bloom. When the fallen palm fronds were examined, several were found with old nest entrances.

While trying to catch one of the carpenter bees for identification, several bees were noticed to have established territories. One hovered approximately seven feet off the ground in front of the branches of a dead tree (probably *Salix*). In a period of about 15 minutes it chased eight or nine bees and always returned to what appeared to be the exact spot. Two other bees were seen hovering at about 15 feet off the ground about 1 foot in front of the skirts of two palm trees. These also chased other bees and returned to the same place. Another patrolled an area of about 5 by 8 feet about a foot above a blooming *Salix* shrub (10 feet above the ground). The bee flew off and returned about 4 times during the same period. During one of its absences another bee flew into the blossoms, but we disturbed it while trying to catch it. A male was caught and subsequently identified by Dr. Paul D. Hurd, Jr. This bee was feeding at *Salix* blossoms 20 feet away.

Several long flights away from the palms were seen with one bee in the lead and two to four others following. Twice clusters of bees were observed tumbling in a roiling mass as they flew upward out of sight (once three bees, once five). Although we assume these were mating attempts, we were unable to observe their sex in flight.

The two fronds subsequently cut open showed typical excavations. The entrance was on the under (inner) side of the frond with the burrow extending downward toward the pendant fan leaf. One showed a 2.5-cm excavation upward toward the trunk as well as a 15-cm excavation down the stem. A second frond (Fig. 1) contained undamaged cells with decayed contents; apparently contact with the ground had made environmental conditions unsuitable for development. The length



EXPLANATION OF FIGURE

Fig. 1. Counterpart longitudinal sections of the nesting burrow of *Xylocopa* (*Xylocopoides*) *californica arizonensis* Cresson in a frond of fan palm, *Washingtonia filifera*.

of the gallery was 21.7 cm, each cell was 1.8 to 2.2 cm long and 1.7 or 1.6 cm wide. In this specimen the frond had broken off the palm at the entrance area.

Bees of this subspecies are known to nest also in *Agave*, *Yucca*, *Dasylyrion*, redwood, and *Populus fremontii* (Hurd, 1955: 45). The first three plants, in common with the palm, have a hard exterior sheath, a soft pithy interior, and a relatively small diameter.

The authors especially wish to thank Dr. Paul D. Hurd, Jr. His interest in carpenter bees stimulated these observations and he identified the bee involved. We are also grateful to Mr. William R. Superbaugh, Superintendent, Joshua Tree National Monument, for granting permission to conduct these observations of National Monument property. We further acknowledge the National Science Foundation (Grant GB 2973, "Carpenter Bees of the World") for assistance with funds for photography and publication. One frond is being returned to the Joshua Tree National Monument, the other, with the bee, is being maintained in the voucher collection of the University of California.

LITERATURE CITED

- HURD, P. D., JR. 1955. The earpenter bees of California (Hymenoptera : Apoidea). *Bull. California Insect Surv.*, 4: 35-72.

Premature Eversion of the Ovipositor in a Pupa of *Tribolium confusum* Duval¹ (Coleoptera : Tenebrionidae)

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Normal female pupae of *Tribolium confusum* Duval are characterized by the possession of large, ventral genital lobes anterior to the prominent urogomphi (Fig. 1A). A female pupa has been discovered which differed from this normal condition (Fig. 1B). The pupa had developed to the point of having a pigmented compound eye; mandibles were dark brown in color, and tarsal segments and tarsal claws were visible through the pupal cuticula. It was estimated from these criteria that this female was a day short of completing pupal development. The

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